

AMENDMENTS TO THE DRAWINGS

Attached hereto are two sheets of corrected formal drawings, in compliance with the provisions of 37 C.F.R. § 1.84. These sheets, which depict Figures 5A, 5B, 5C and Figures 6A and 6B replace the original sheet depicting these figures and are each labelled "**REPLACEMENT SHEET**."

R E M A R K S

The specification has been amended so as to correct some informalities and utilize the same terminology and reference numerals throughout.

More specifically, the proper naval construction term is "block coefficient" as found, for example, on page 5, line 1 of the original specification. The term "blocking factor," which is less appropriate, has therefore been changed throughout to "block coefficient."

Page 9, line 17 is amended to provide another one of the many available elastomer materials which can be used with this invention. This material has been available commercially before the filing date of the application and represents still another elastomer that can be used with this invention. It is also noted that strain rate sensitive elastomers are particularly appropriate for use in this invention.

Additionally, the same parts had been designated in the specification by different reference numerals. More specifically, the elastomer has been identified, for example, in Figure 5C by reference numeral (10) as also by reference numeral (20). To assure uniformity, Figures 5A, 5B and 5C are amended to provide consistency. Approval of these changes is respectfully requested as no new matter is involved, and it is further requested that the Replacement Sheets be made a part of the record of the above-identified application.

Finally, Figure 6B is also changed to provide uniformity between Figures 6A and 6B of the thickness of the connection cross structure which is made of stiffened steel plating as used in conventional ship design (see page 11, lines 1-12 of the original disclosure). There is no difference between these two figures insofar as this part is concerned.

Turning next to the claims, claim 1 has been amended to point out what is clearly implicit from the disclosure of the instant application to set forth that the curved outer shape of the mid-section is in the longitudinal direction.

Claim 4 is amended to avoid any problems with antecedent terminology, while claim 5 is amended to specify the type of composite materials.

Claim 8, which has been indicated allowable, has been rewritten in independent form to include the limitations of claims 1, 5 and 7.

Claim 11 has been amended to avoid any misinterpretation of the nature of the curved outer shape of the mid-section.

Claim 18, which has been indicated allowable if rewritten in independent form, has been so rewritten.

Claim 19 has been amended so as to be dependent on claim 14.

The rejection of claims 11-17 and 19 under 35 U.S.C. § 112, second paragraph, as being indefinite is respectfully traversed for the following reasons.

Claim 16, which is dependent on claim 15 has clear antecedent basis for the stiffener means in claim 15.

As to the remaining alleged indefiniteness, the amendments to the claims should avoid any further questions as to this much-abused ground of rejection.

The rejection of claim 1 as anticipated under 35 U.S.C. § 102 by the U.S. Patent 5,263,428 to Mo is respectfully traversed for the following reasons.

The U.S. Patent 5,263,428 to Mo relates to a hull construction for submarines made of monolithic concrete material which has nothing to do with the present invention. In fact, a hull construction as claimed in claim 1 would be totally unsuitable for a submarine because it would not be able to withstand the pressures during submersion. It is for that reason that the **Mo** patent limits its hull to cylindrical shapes of a material which would make no sense in a ship provided with bow and stern sections capable of achieving the particular characteristics mentioned in this application. Moreover, to avoid the unwarranted inappropriate interpretation of the limitations in claim 1, the "curved shape" of the mid-section has been specified in clear language. Applicant appreciates that claims are interpreted for examination purposes in the broadest possible manner. However, this permissiveness is limited by what the claims actually mean, in the light of the overall invention.

Accordingly, reconsideration of the rejection of claim 1 under 35 U.S.C. § 102 is respectfully requested.

The rejection of claims 1-7 and 9-13 as unpatentable over Sikora et al. in view of Critchfield et al. is respectfully traversed for the following reasons.

The U.S. Patent 6,505,571 to Critchfield et al. and its differences to the present invention have been fully set forth on page 4, lines 11-20 of the original disclosure. More specifically, as pointed out in this passage, this patent is concerned with some types of connections between composite and steel hybrid constructions, and more particularly between a fiber-plastic and a metallic hull section. By contrast, this invention relates to "hulls with a curved mid-body section made of composites with light framing on the inside thereof for the mid-body section that transmit the sea loads to the longitudinal framing or the bulkheads."

In other words, this patent is merely concerned with different types of connections and methods of making such joint constructions which can be used in a hybrid hull. As pointed out in column 1, lines 19-27, an important object of this patent is

"to provide for the construction of a hull for various marine vessels including naval and commercial ships which will not only minimize fabrication costs but will at the same time accommodate various requirements such as those providing reduced radar and magnetic signatures and absorption of noise generated by propulsion machinery on naval ships."

Again, discussing the material differences of the metallic mid-section and of the fiber-reinforced plastic materials for the bow and stern, this patent clearly points out that

"In order to render such differently constructed mid-ship, bow and stern sections **geometrically compatible**, they are provided with **transition extensions that overlap and are attached to each other by special joints to complete a hybrid hull assembly.**"

The four different shell sections illustrated in Figures 2, 2A, 3 and 3A all involve the use of extended metallic hat stiffeners to achieve the geometric compatibility. This is the sum total of the disclosure of this patent. However, there is no suggestion of the main concept of the present invention for a ship hull construction with a curved mid-section and an outer skin made of composite materials that carry the sea pressure loading only, whereby loading is transferred by framing and decks to the inner structure in the mid-section. This inner structure which is made from steel, carries the entire sea loading, normally referred to as the hull-girder loads. This approach represents a complex and profound engineering feat which is the subject of this invention and which is neither addressed nor disclosed in **Critchfield et al.**

The **Sikora et al.** patent has been mentioned on page 5, lines 25-29 and its shortcomings vis-à-vis the present invention have been discussed in the following passages of the instant specification.

Risking the danger of repetition, the **U.S. Patent 5,582,124 to Sikora et al.** discloses a **straight** advanced double-hull (ADH) construction which has nothing to do with the present invention. **Sikora**

et al. acknowledge the need of transverse support to withstand the applied external sea loads and internal cargo loads in the longitudinal cells formed by the inner hull, outer hull and longitudinal support members (column 1, lines 53-59). **Sikora et al.** are primarily concerned with providing for large double-hull vessel designs, transverse supports while reducing the number of longitudinal tanks and increasing the length of longitudinal tanks without detrimentally affecting the structural strength, weight or cost of the vessel (column 2, lines 35-40).

The Examiner's attention is also respectfully directed to the fact that reference to a hybrid framing system in the **Sikora et al.** patent refers to a **hybrid framing system** which is different from a hybrid hull construction. The hybrid framing in **Sikora et al.** consists of a longitudinal and transverse framing system, contrasted by the hybrid hull construction (i.e. made of composite material and steel) of this invention which, with an advanced double hull bottom, uses composite outer shells made of GRP material.

Moreover, the outer shells of **Sikora et al.** are rectilinear as clearly shown in Figures 7A and 7B but do not involve the claimed curved outer shape that is fundamental to ships of low block coefficient such as the destroyer illustrated in Figure 1 of this application.

Applicant therefore respectfully traverses the rejection of claims 1-7 and 9-13 under 35 U.S.C. § 103(a) because the rejection is based on a misinterpretation of the specific disclosures of the references and of an

arbitrary combination of the references that can be attributed only to hindsight of the instant disclosure. Moreover, even if combined, these references do not render the claims unpatentable because the references do not address the problem to be solved only by the present invention; that is, a ship with a curved mid-section that has the characteristics of the mid-, bow and stern sections as set forth in the claims. More specifically, applicant takes issue with the interpretation of Figure 1 of **Critchfield et al.** because this figure is a "**perspective view** of an ADH hull module" (column 4, line 30) and gives no indication of any curvature. Applicant strenuously objects to the attempted hindsight justification for curvature based on alleged better stability. Furthermore, the conclusory statement of what would have been obvious to a person skilled in the art completely ignores that this invention addresses specific problems encountered with a specific type of ship having particular characteristics.

Accordingly, reconsideration of the rejection of claims 1-7 and 9-13 is respectfully traversed.

The rejection of claim 20 under 35 U.S.C. § 103 over Harley is also respectfully traversed for the following reasons.

The U.S. Patent 5,570,650 to Harley is concerned with the specific shape of the twin hull pontoons to provide a form of pressurized air cushions, maintained in a portion of the bottom of the hull for reducing water drag and thereby gain hydrodynamic performance.

By contrast, this invention is concerned with the construction of the pontoons that have a specific shape and can be made in the manner of a hybrid hull construction as disclosed. Claim 20 clearly sets forth the construction of the mid-section which includes a steel frame with composite skin and steel double-hull construction.

Risking the danger of oversimplification, **Harley** basically addresses shapes of the pontoons while claim 20 sets forth the hybrid construction of a catamaran where hybrid refers to the use of two materials; that is, composite and steel.

Accordingly, reconsideration of the rejection of claim 20 is respectfully requested.

A serious effort has been made to point out the differences between the present invention and the prior art relied upon in order to advance the prosecution of this application. If only minor matters remain preventing the allowance of the application, it is suggested that the Examiner contact the undersigned by telephone at the number indicated hereinafter in an attempt to resolve these differences.

A check in the amount of \$44.00 for the additional independent claim is attached hereto, applicant claiming Small Entity status. However, it is respectfully requested that any shortage of fees be charged to the account of Paul M. Craig, Jr., Account No. 03-3560.

Finally, attached to this Amendment for the convenience of the Examiner are copies of the figures of the drawing indicating in red the

changes in these figures made in the replacement drawings. As no new matter is involved, approval of the Replacement Drawings and of the changes to the specification is respectfully requested.

Respectfully submitted



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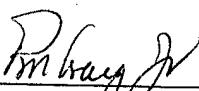
Attachments

CERTIFICATE OF MAILING

I hereby certify that this correspondence, an Amendment under 37 C.F.R. § 1.111, is being deposited with the United States Postal Service, as First Class Mail, postage prepaid, in an envelope addressed to

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

this 13th day of January, 2005.



Paul M. Craig, Jr.

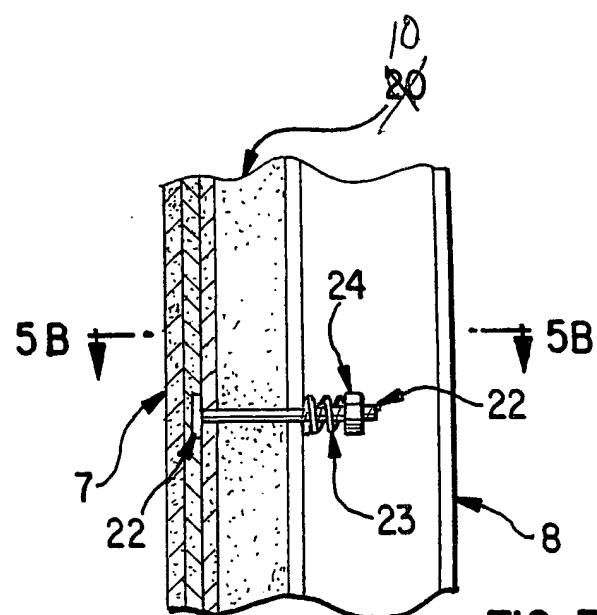


FIG. 5A

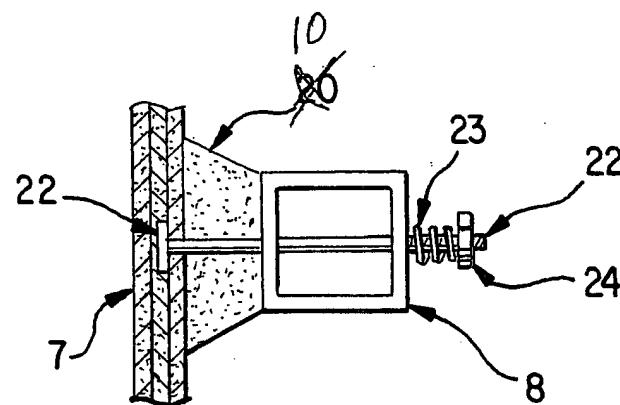


FIG. 5B

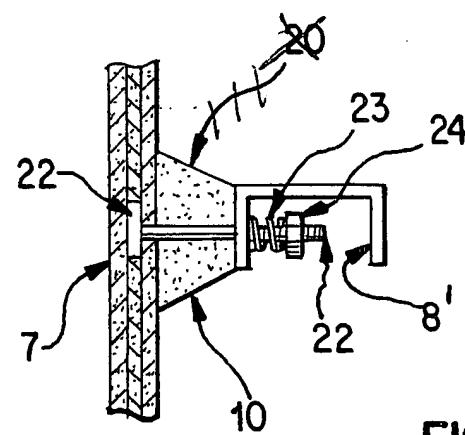


FIG. 5C

